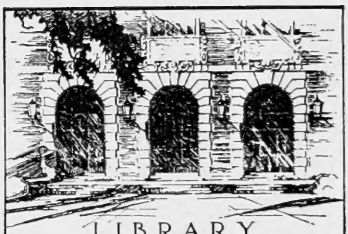
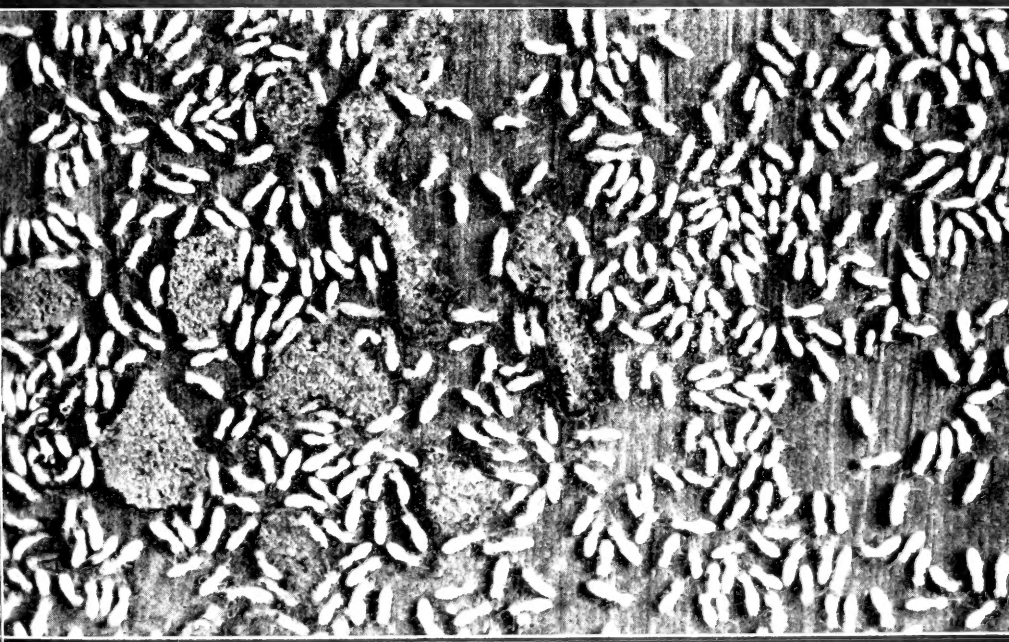


ow to Recognize and Control
ERMITES *in Illinois*

B. G. BERGER



Illinois Natural History Survey
Circular 41

STATE OF ILLINOIS
DWIGHT H. GREEN, *Governor*
DEPARTMENT OF REGISTRATION AND EDUCATION
FRANK G. THOMPSON, *Director*

How to Recognize and Control Termites in Illinois

B. G. BERGER

Printed by Authority of the State of Illinois

NATURAL HISTORY SURVEY DIVISION
LEO R. TEHON, *Acting Chief*

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How to Recognize and Contr

The most effective termite control begins when the building is being planned.

ERMITES *in Illinois*

B. G. BERGER

TERMITES were in Illinois long before the first white settlers arrived. Before wooden structures were built here, the termites fed upon the dead wood in the forests and in the stream bottom lands. With the clearing of the woodlands and the construction of towns, where frame buildings were placed within short distances of one another, termites found in structural timbers and other lumber much material for their destructive feeding.

In Illinois, the damage caused annually by termites increases progressively from north to south. The exact amount of damage caused by these insects is difficult to determine because adequate records covering termite damage are not available. That the damage is extensive is indicated in part by the more than $250,000 spent yearly in Illinois for professional services to control termites. To this figure should be added the great but unknown cost of damage to wood, books, and other articles in thousands of buildings infested with termites but not treated, the cost involved in the reconstruction of termite-damaged buildings not chemically treated, and the cost of chemical treatments made by home owners and other unskilled workers. The cost of replacing termite-damaged wood in houses, outbuildings, signposts, fences, and other wooden fixtures in contact with the ground is probably 10 times the amount spent for the chemical control of termites.

To the losses resulting from the actual damage done by termites should be added the cost of preventive measures. Huge sums of money are spent yearly for wood preservatives. These materials are purchased by home owners, carpenters, sash and door manufacturers, public utility companies, railroad corporations, mine operators, and other large users of wood and wood products. In attempting to construct buildings that are termite proof, contractors often use metal shields, treated wood, or a wood treatment for areas where termites might gain access to

the structures. The money spent to prevent termite damage must be included as part of the indemnity paid to termites.

Recognizing Termite Damage

If a careful inspection of the premises is made each year, any termites present may be discovered before they have done extensive damage. All the outside wood on the premises in contact with soil should be examined for signs of the insects. Typical termite damage is shown in figs. 1 and 30. Both exterior and interior surfaces of foundation walls, especially unexposed areas beneath porches, should be inspected for the covered runways or shelter tubes built by termites as bridges between the soil and the wood upon which they feed.

Inside the building, wood extending through the basement floor, over the floor, or in contact with the basement walls should

Fig. 1.—A large structural timber showing at the end characteristic termite damage—soft part of the annual ring has been eaten away.

Fig. 2.—House inspection for possible termite infestation requires a good light, a screw driver or ice pick for probing the timbers, and old clothes. Both sides of foundation walls and the places where floor joists and foundation plates meet should be examined. A termite tube extending over a joist is shown in the upper part of the picture.

be examined for termites or termite damage. Special care should be taken to examine the area where the joists and foundation plates meet, fig. 2. By tapping or poking the wood with a screw driver or an ice pick, an estimate of the soundness of the timbers can be made. A flashlight will aid the inspector in examining dark areas for termite tubes. If a thorough inspection does not reveal evidence of termite activity, there is no cause for alarm, even though termites are known to be in the neighborhood.

When a building is found to be infested with termites, the owner should, if possible, determine the point of entrance, the full extent of the damage, and the size of the colony. If the infested wood is full of termites, if there are numerous shelter tubes on the wood and foundation walls, and if there is extensive damage to wooden members, figs. 1 and 3, then the application

Fig. 3.—Part of a house severely damaged by termites. Some of the foundation plate, floor joists, and sheathing had to be replaced and the studding reinforced because of termite attack.

of control measures should not be delayed. The cost of termite control is high, but the additional damage resulting from delay may be more costly than the control measures. The illustrations and text of this circular should enable the building owner to learn how termites gain access to buildings, how the insects live, and how to control them in various types of building construction. The building owner will have to decide for himself whether he should ignore the termites, control them by reconstruction of the building, treat the building chemically with local labor, or have the termites controlled chemically by a reliable pest control operator. The type of building construction will influence the decision to some extent, because some types are more easily treated than others.

Insects Mistaken for Termites

Some other insects are often suspected of being termites because they are found in wood or are found swarming about

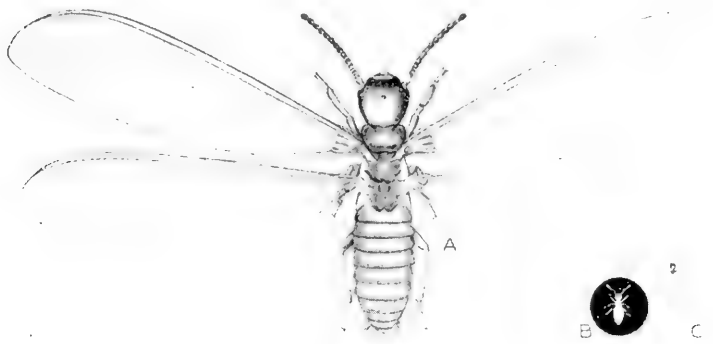

Fig. 4.—The subterranean termite commonly found in Illinois, *Reticulitermes flavipes* (Kollar). *A*, primary reproductive (queen), many times actual size, with wings spread in unnatural position. The broad waist, straight antennae, and indistinct veins of the wings distinguish the termite from the ant. *B*, worker, natural size. *C*, primary reproductive (queen), natural size, with wings in normal resting position.

Fig. 5.—A harmless winged ant, *Lasius interjectus* Mayr, commonly called the large odorous ant, with which the winged reproductive form of the termite is often confused; in the spring either or both may be found swarming in basements. However, termite swarmers are black, and the swarmers of this ant are yellowish brown. *A*, queen ant, many times actual size. The narrow waist, distinct veins of the wings, short hind wings, and bent antennae distinguish the ant. *B*, worker ant, natural size. *C*, queen, natural size, with wings partially closed and as usually seen.

the house during the spring of the year, which is the usual swarming time for Illinois termites. Insects most commonly confused with termites are ants. One of these is the large odorous ant. The yellowish-brown color of this ant distinguishes

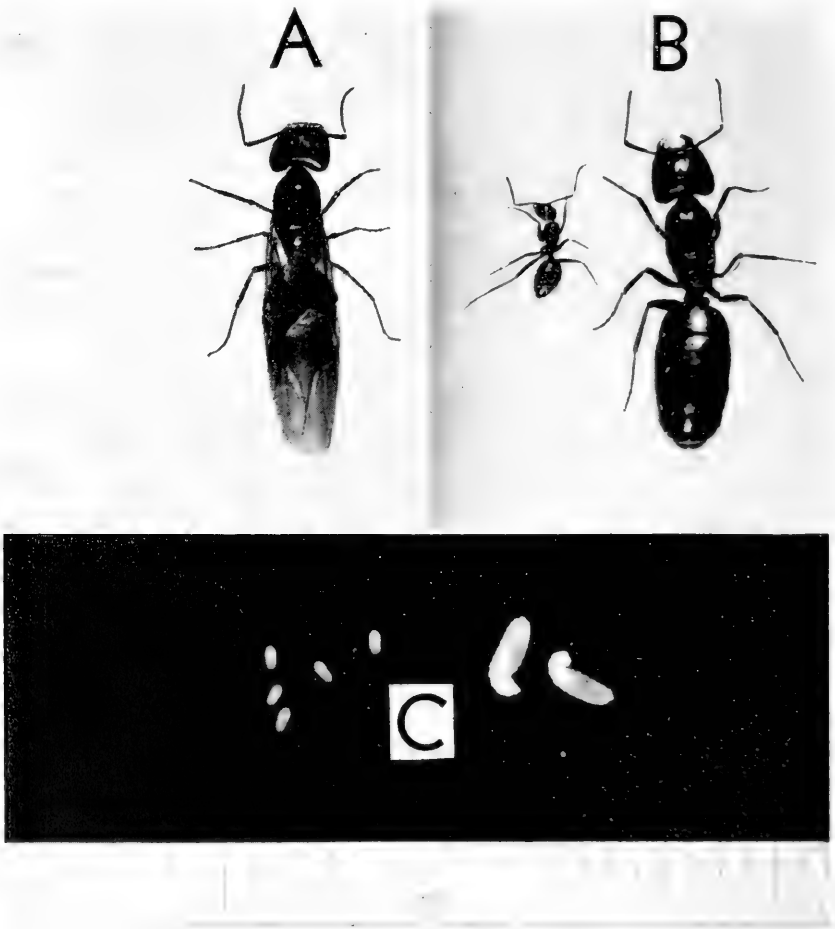

Fig. 6.—*A*, queen of the black carpenter ant, *Camponotus herculeanus pennsylvanicus* (De Geer). This ant, at the time of swarming, has wings with distinct veins. *B*, the larger insect is a carpenter ant queen with the wings removed; the smaller is the first worker produced by the queen. The slender waist of the ant queen is in sharp contrast to the waist of the termite queen. *C*, eggs and larvae, or young, of the carpenter ant. The ant larvae are about the size and color of termite workers but have no legs. Because the ant larvae are incapable of rapid movement, they are carried around by the ant workers.

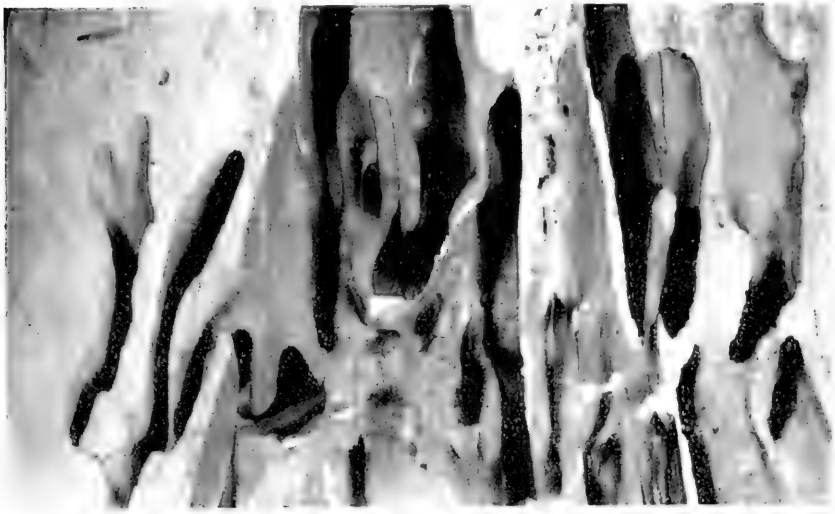

Fig. 7.—Longitudinal cut through a dead tree limb showing extensive and irregular tunnels made by carpenter ants.

it from the black, swarming reproductive termite which somewhat resembles this ant in size and shape. Some of the swarming black ants are less easily distinguished from the swarming reproductive termite. Figs. 4 and 5 show enlarged drawings of a reproductive termite and a queen ant.

Characteristic of the termite are the four wings, of almost equal size and with indistinct veins; also the greater length of the wings in comparison with the length of the body. The four wings are folded one on top of another when the insect is not in flight, as shown in one of the small drawings in fig. 4. The termite does not have a slender waist, as do all ants. The wings of the ant have distinct veins, and the hind wings are smaller in size than the front wings. After a short flight, the swarming termites break off their wings and crawl actively about in search of mates and a location where a colony may be started. The removed wings may be found in abundance on basement floors or at basement windows. A mass of removed insect wings is a sure sign of the presence of termites. Ants do not break off their wings immediately after the swarming flight.

Carpenter ants, fig. 6, which infest wood, do not eat it, but tunnel out nesting sites, fig. 7. They seldom cause extensive damage in sound wood. Although they are black in color, they

are larger than termites and have the constricted waists common to all ants. The white larvae, which they carry around when disturbed, are legless and can be readily distinguished from the

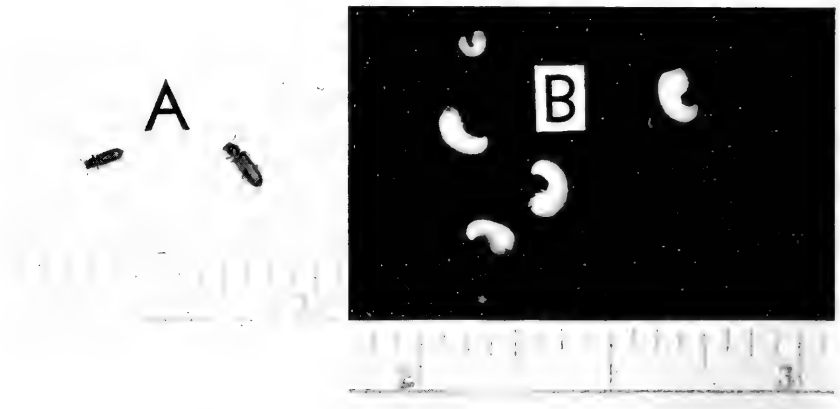

Fig. 8.—*A*, adults, and *B*, larvae, or young, of the powder-post beetle, *Lyctus cavicolis* Le Conte.

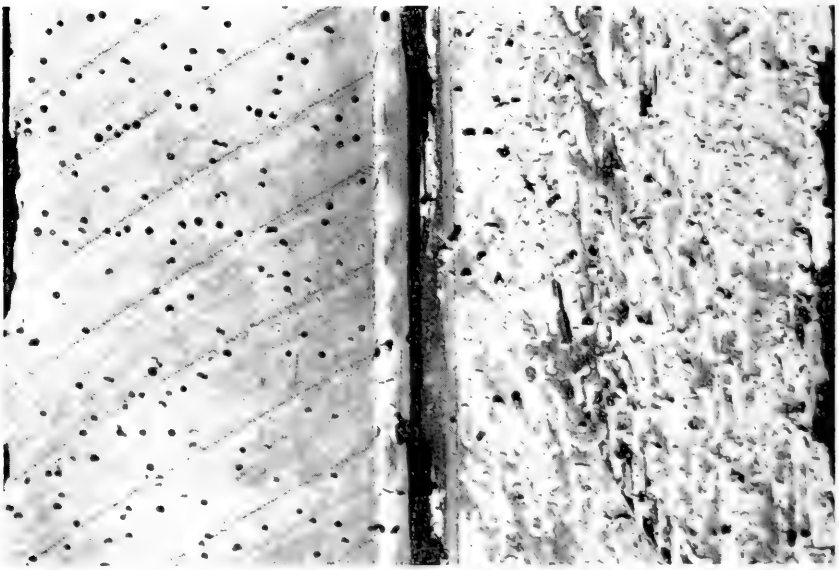

Fig. 9.—Views of the outside (left) and inside (right) of a timber heavily damaged by powder-post beetles. Unlike these beetles, termites never fill their galleries with finely powdered wood; nor do they make numerous round exit holes to the surface of the wood.

Fig. 10.—Views of the inside (left) and outside (right) of a white-washed timber severely damaged by fungi. No insects were responsible for this damage.

termite workers, which are sometimes called white ants. Unlike termite galleries, the galleries built by carpenter ants in their nest-building do not follow the soft wood of the annual ring. The walls are smooth and are not plastered with dirt and excrement, as are the walls of termite galleries.

The workings of other insects in wood are sometimes confused with those of termites. Powder-post beetles, fig. 8, cause considerable damage to wood, fig. 9. They make small, round holes from the interior to the surface of the wood, each hole representing an emergence opening made by an adult beetle. The female beetle deposits her eggs in the exposed wood pores; the larvae tunnel through the wood, reducing it to a powder. Often small piles of powdered wood are found on the surface of hardwood floors or beneath timbers infested with powder-post beetles. Subterranean termites, the kind found in Illinois, do not make such holes or piles of sawdust, and the galleries of subterranean termites never contain wood powder.

Some fungi infest wood, causing considerable damage, which is often confused with termite damage only because the home owner, upon seeing the decayed wood, immediately thinks of

termites. Wood infested with fungi does not have the galleries or wood powder common to insect-infested wood. There are many fungi that damage wood, as shown in fig. 10.

Illinois Termites and Their Habits

Most of the termite damage to buildings in Illinois is caused by the species known as *Reticulitermes flavipes*. Three other termite species are found in Illinois, but usually only in isolated wooded areas.* The following statements apply in particular to *Reticulitermes flavipes*, but, because all Illinois termites are similar in habits, most of them apply also to the other species.

In warm basements, termite colonies may send out swarmers as early as February; however, out-of-door swarming occurs usually from the middle of May through the first week of June.

The swarmers, which are the primary sexual forms, are black in color and have four long, silvery wings. In the first part of their flight, the swarmers usually stay together. Then the flight separates into groups, and all the swarmers finally alight on the ground, break off their wings, and pair. The male of each pair usually follows the female about in search of a nesting site. During this time the termites are preyed upon by insect-eating birds and other animals. Few of the swarmers succeed in finding new places suitable for nesting sites. Those pairs that establish a nest produce a limited number of offspring during the first year. Fourteen such pairs observed in the October after mating had an average of three nymphs or young per nest; the largest number was nine. Fig. 11 pictures a female swarmer found in a colony of termites infesting a house in Illinois. Although this female, whose age was unknown, had an abdomen that was greatly enlarged as a result of egg laying, she was capable of crawling about. The male swarmer does not have the enlarged abdomen. The male and female, better known as the primary royal pair, remain together for life. The average length of life of the primary reproductive form is unknown, but it is believed to be a number of years, while the life expectancy of the other termite forms or castes is 1 to 2 years.

When the termite workers from the first eggs are capable of taking care of the young colony, reproduction increases until, with the growth and spread of the colony, secondary colonies

*The species of termites found in Illinois, all subterranean termites, are *Reticulitermes flavipes* (Kollar), *R. tibialis* Banks, *R. virginicus* Banks, and *R. hageni* Banks.

are started. It is believed that the secondary colonies are connected with the original colonies by underground tubes, at least until the new colonies are well established. Egg laying in the new colonies is done by secondary and tertiary forms of reproductives, fig. 12. These reproductives are slightly larger than workers and are creamy white to light brown in color. The rate of egg laying in the new colonies may be greater than in the original colony because of the greater number of reproductive individuals. In one case, 455 secondary reproductives were removed from a wooden stake measuring 2 inches square and 2 feet long. It is not uncommon to find 20 or 30 secondary queens in such a stake that is heavily infested with termites. Third form reproductives, often found with the secondaries, are lighter in color than the secondaries and between the workers and the secondaries in size.

In addition to the reproductives, there are in the termite colony soldiers and workers. Both forms are sightless, wingless, and creamy white in color. As they do not leave the colony, they are not seen unless colony or galleries are broken open.

The soldiers, fig. 12, possess enlarged brown heads and jaws; their function is to defend the colony. When a passage tube is broken, the soldiers use their heads to plug the opening

Fig. 11.—Primary reproductive termite queen. The wings have been removed and the broadly joined abdomen has been greatly enlarged as a result of egg production. About twice natural size.

and their jaws to snap at intruders until the workers can patch the tube. If the passageway is being extended, the soldiers move forward with the workers, always protecting the opening. Because of their enlarged jaws, the soldiers cannot chew the wood directly and therefore are fed by the workers.

The most numerous of the insects comprising the termite colony are the workers, fig. 12. These are smaller than the reproductives and, although of both sexes, do not lay eggs. The workers are the insects that eat the wood and therefore are responsible for the damage. Termite colonies usually include

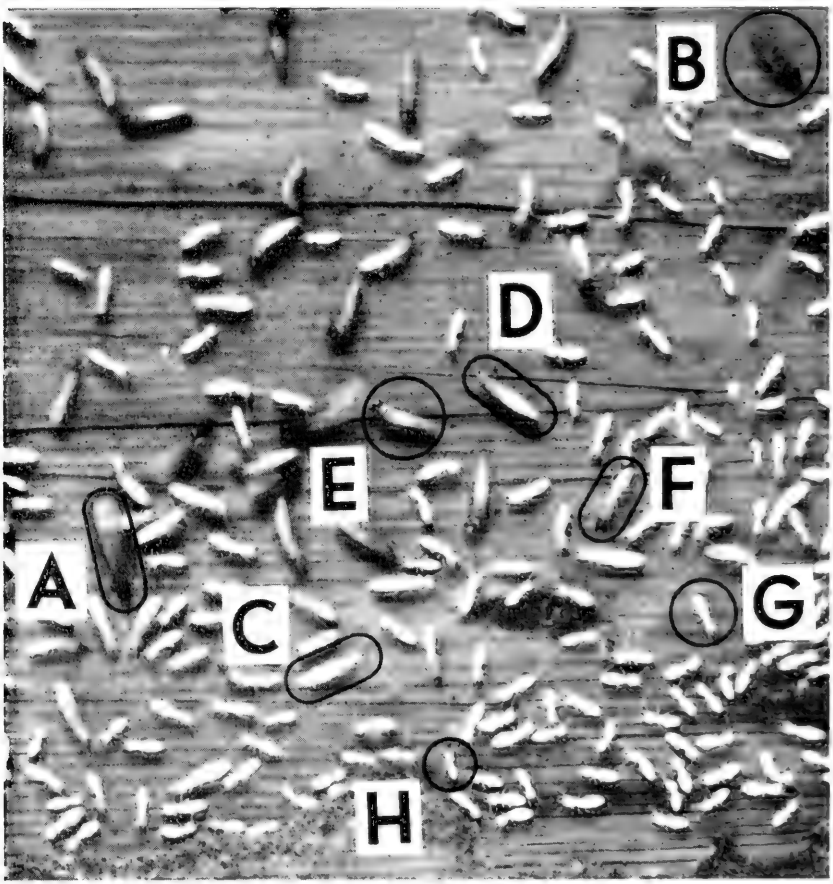

Fig. 12.—Termite forms or castes. *A*, swarming reproductive with wings; *B*, swarming reproductive with wings removed; *C*, young swarming reproductive; *D*, secondary female reproductive; *E*, secondary male reproductive; *F*, soldier; *G*, worker; *H*, nymph or young.

a large number of young termites, fig. 12. During the first few stages of their development the members of all castes or forms look somewhat alike and to a casual observer all resemble workers. Members of each form in the colony are dependent on members of all the other forms.

Subterranean termites, when infesting wood out of contact with the ground, construct, between the ground and their galleries, shelter tubes that protect them from direct light, the drying effects of the atmosphere, and exposure to their enemies, as well as give a covered runway to moisture in the ground. Because of their location and color, these shelter tubes, figs. 2 and 20, often are difficult to see.

Structural Control

Many prospective builders fail to consider subterranean termites when discussing construction plans with their con-

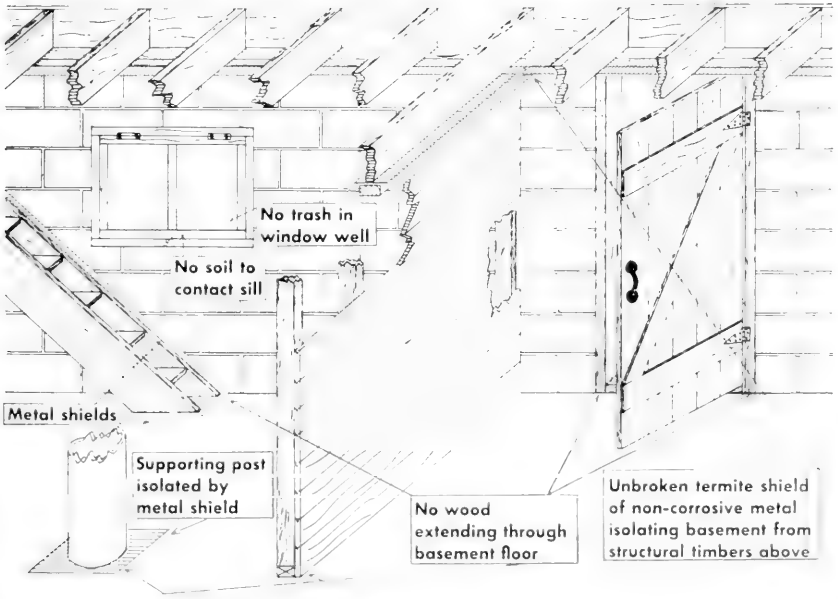

Fig. 13.—Basements should be constructed to prevent entrance of termites to such features as supporting posts, steps, partition walls, windows, and doors. Non-corrosive metal shields should be used to isolate these features so that termites will be unable to reach first floor structural timbers without constructing, over shields, shelter tubes that can be readily seen. The metal should be lapped and soldered where sections of shields are joined.

tractors. The adoption of certain structural measures at this time will greatly lessen the danger of a termite infestation later on, figs. 13, 14, and 32, and give the building owner considerable peace of mind. Proper construction is the cheapest control for termites. Since termites must have contact with moisture and woody tissue for their continued development, and the moisture is usually obtained from the soil, in proper construction no wood is left in contact with the soil. All wood in the structure should be isolated so that termites cannot gain access to it without building shelter tubes in exposed places where they may be readily detected and the termites quickly destroyed by supplementary control measures.

When planning a new home or other building, examine all wood on the site for evidence of termites, question the neighbors, and if possible check with local pest control operators. If ter-

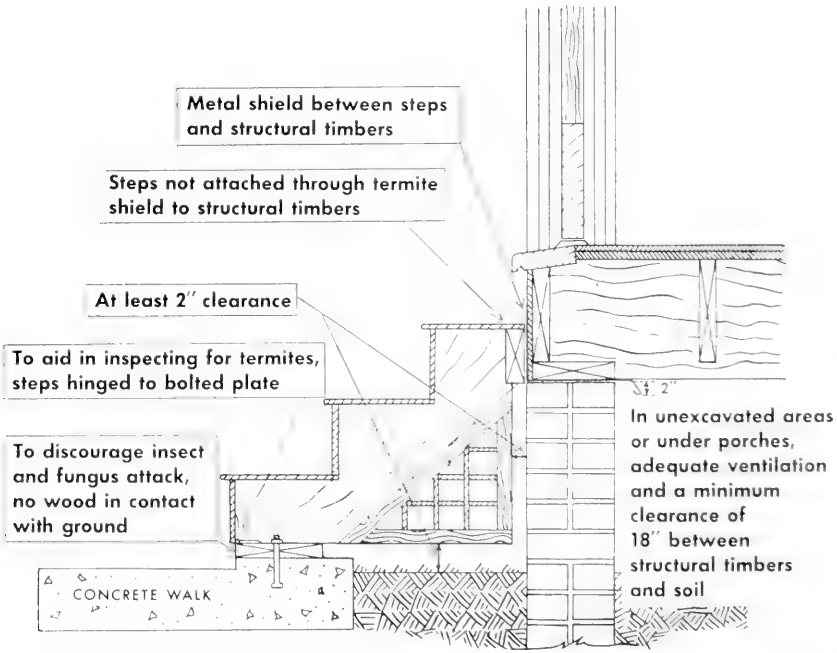

Fig. 14.—Steps and lattices, as well as ground-level doors and windows, all of which are possible avenues of entrance for termites to structural timbers, should be so constructed, or reconstructed, that no wood is in contact with soil. Special emphasis should be placed on inspection of these features at the time the entire structure is examined semiannually for the presence of termites.

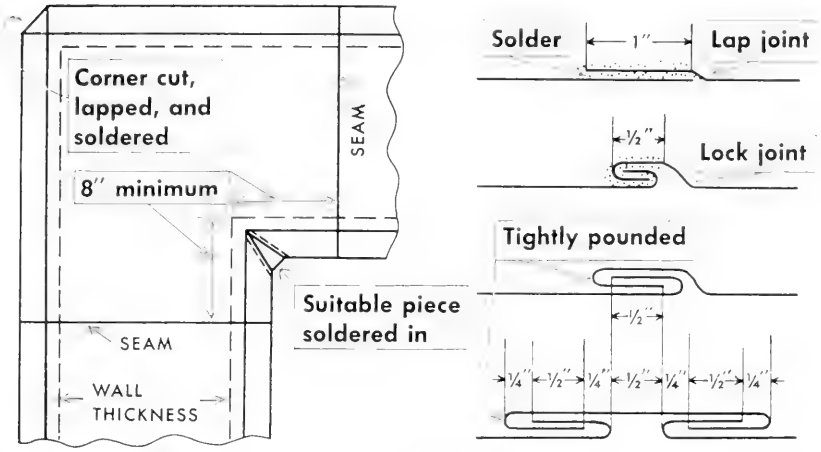

Fig. 15.—Methods of joining shielding material so that termites cannot find at the joints minute cracks that allow them to pass and to feed unseen on structural timbers.

mites are not present and have never been reported in the neighborhood, the additional expense involved in making the structure termite resistant may not be justified. If termites are present or have been present in the vicinity, it is wise to design the structure so that termites will have difficulty in gaining access to the wood without being seen.

Termite shields, figs. 13, 15, and 16, when properly installed

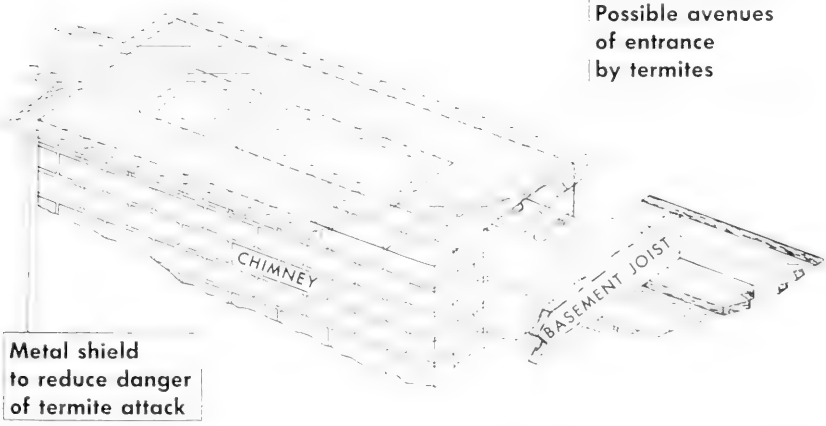

Fig. 16.—A metal shield completely bisecting chimney is an aid in preventing termites from entering structural timbers unseen. Termite shields should isolate all overhead timbers from the foundation wall.

between the foundation walls and the superstructure, are the home owner's best insurance against hidden termite attack. These shields do not necessarily keep termites out of buildings; they will, however, force the insects to build their shelter tubes in the open, where they can be detected and where proper control measures can be taken. In buildings without shields, or in which shields are improperly installed, termites are able to enter voids or hollow places in the foundation walls, or cracks in the walls, and thereby gain access to the wooden structural timbers above, fig. 17, without giving any outward sign of their presence until they have done considerable damage. Termite shields are good insurance only when they are installed properly and inspected regularly; otherwise they give the home owner a false feeling of security. If common faults in the application of metal shields are to be avoided, a non-corrosive metal that is heavy enough to last for the life of the structure should be used; nails must not extend through the shields to make holes for the

Fig. 17.—A house foundation that has the outer walls capped with solid concrete blocks leads to the impression that the house is termite proof. This impression may be erroneous. Termites may gain access to structural timbers through the hollow blocks of the inside foundation walls or through joints between the solid blocks. Seldom are blocks joined so well that termites cannot find a way to wood above. A metal shield or a cap of poured reinforced concrete is preferable to the solid blocks shown here.

entrance of termites, fig. 14; and ends and corners must be sealed or soldered correctly, fig. 15. Shields of capping blocks and other non-metals must be tightly bonded, fig. 18, and must

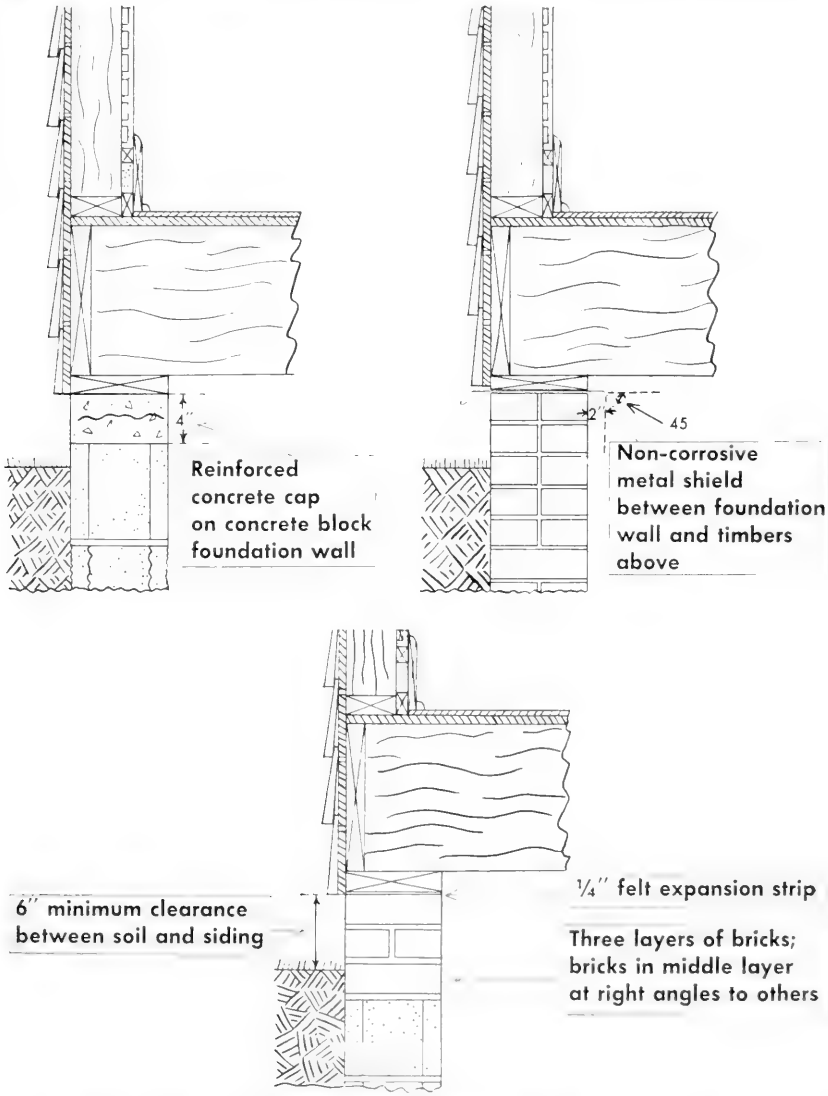

Fig. 18.—Types of shields used in preventing infestation of buildings by termites. Shields may not repel termites, but they prevent attacks that cannot be detected by careful inspections. If termites are found building shelter tubes over these shields, the tubes should be destroyed and chemicals applied for control of the termite colony.

cover all foundation walls completely. Fig. 17 shows a poor job of shielding with capping blocks.

The use of chemically treated lumber is recommended in all places where wood is to be within 18 inches of the soil. Lumber that has been pressure treated in closed cylinders with chemicals so as to render it resistant to termites and decay is preferred. Wood chemically treated in a preservative alternately heated and cooled several times until the wood has absorbed the desired amount of chemical is also satisfactory. Lumber treated by either of these methods can be used in proximity to the soil. If lumber so treated must be cut, all cut surfaces should have additional preservatives applied to them; two applications with a sprayer or paint brush should be made, the second after the first has dried.

In structures infested with termites, the application of a chemical preservative by pressure treatment to the wood already in place is a good precautionary or supplementary measure to use along with reconstruction, soil poisoning, and void poisoning. However, wood that has been pressure treated in place should not be confused with wood treated by the two methods described in the preceding paragraph, because wood treated in place does not take up enough chemical to make it completely resistant to termites. Often the chemical penetrates only with the grain of the wood. Consequently, much of the wood remains susceptible to termite attack. It is impossible to drill a sufficient number of holes in structural timbers to impregnate the wood thoroughly without seriously weakening the timbers. Also, it is impossible to treat all the wood that is available to termites after it is in place in the structure.

Wood is often thought to be protected from termites and decay after it has had a preservative applied to the surface by dipping, spraying, or brushing. The thorough application of a preservative by any of these methods is of some value for the control of fungi, but it does not repel termites.

Areas beneath porches, and other unexcavated areas beneath buildings, should have proper ventilation, figs. 14 and 21, so that, as far as possible, conditions there will be unfavorable for termites. Ventilating openings need not be placed in conspicuous places, but they should not be covered with shrubbery. The size of each opening will depend upon the area enclosed and the moisture content of the soil. As a general rule, 2 square feet of opening is sufficient for 25 linear feet of foundation wall.

When the enclosed area is unusually wet, the ventilating openings will need to be larger. Unexcavated areas without ventilation are usually dark and damp, and it is in this type of situation that termites find ideal conditions for their development and in which their activity will not be discovered until considerable damage has been done.

Structural Mistakes

Common building features that render a structure susceptible to termite attack are given below.

1. Voids of foundation walls not isolated from the structural timbers above by properly installed shields. Because of faulty workmanship, many shields do not protect the timbers above the foundation walls from hidden termite attack. Shields accidentally torn, joints, corners, or other parts improperly

Fig. 19.—A house in the process of construction that shows a possible source of infestation by termites. If the building debris is not removed when the porch is backfilled, termites may build a thriving colony beneath the porch, gain access to the foundation plates of the house through the expansion joint where the porch abuts the house, and cause considerable damage before their presence is suspected.

sealed, fig. 17, or shields covered by doors or concrete porches, permit termites to move from the foundation to the structural timbers without being seen.

2. Basement windows on or below the soil level not of steel nor of chemically treated wood; window wells or areaways allowed to accumulate trash, which makes a situation conducive to termite infestation.

3. Porch steps, lattices, foundation skirting, flower trellises, entrances, laths of stucco buildings, or siding of frame buildings in contact with the ground, figs. 14 and 19.

4. Unexcavated areas improperly ventilated, or, if ventilated, with shrubbery blocking openings; such areas allowed to accumulate trash and make conditions suitable for termites.

5. Trash, tree stumps, and other wood, on which termites may feed and build up a thriving colony, allowed to accumulate near buildings, fig. 19.

6. Supporting brick columns not isolated from structural timbers by shields, fig. 21.

7. Concrete basement floors laid after door frames and steps have been set in place, leaving step runners and door

Fig. 20.—Termite tubes extending from the expansion joint between wall and basement floor. The tubes lead to a crack in the wall where termites were able to find a void and continue to wood without being exposed to view.

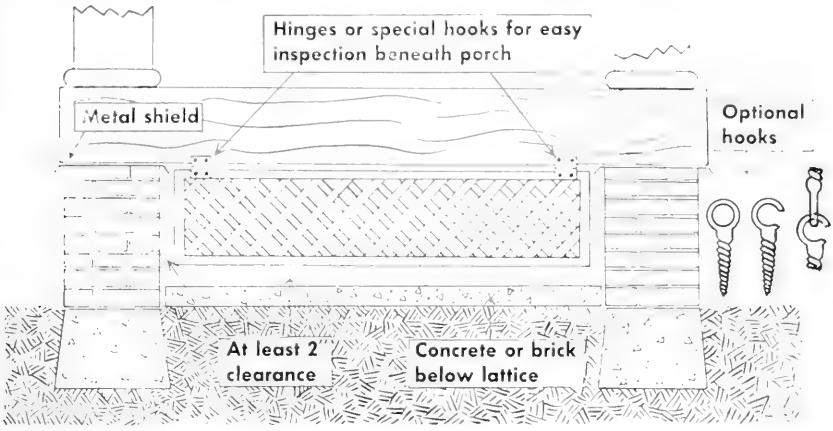

Fig. 21.—Recommended method of attaching porch lattice, which should be hung from hinges or hooks to facilitate frequent inspection of the foundation walls and porch supports. Hooks shown will allow easy removal of lattice. A clearance of 2 inches at sides and bottom will prevent entry of termites from soil or piers; piers should be capped with shields.

frames in direct contact with the soil and allowing them to serve as entrances for termites, fig. 13.

8. Partition walls made with "two-by-fours" anchored to the basement floor by lag screws that are screwed into wooden dowels extending through the basement floor; or a concrete basement floor with cracks in it that allow termites to gain direct access to the 2- by 4-inch runners of the partition wall. Sometimes the 2- by 4-inch runners are laid on the soil before the concrete floor is poured, making a good entrance for termites.

9. Expansion joints where concrete basement floor and foundation walls meet not filled with hot coal-tar pitch; joints allowing easy entrance for termites, figs. 20 and 22.

Many more faults in the construction of buildings might be listed. Construction faults must be corrected before a building is termite resistant. Structural control for termites will vary with the landscaping near the building and with peculiarities of structure and locality. Figs. 13, 14, 18, and 21 show how to correct a few faults by construction or reconstruction.

Chemical Control

In chemical control of termites, thoroughness of application of the chemical is more important than the chemical used. The

application of a chemical for the control of termites demands a general knowledge of building construction and a specialized knowledge of how and where to apply the chemical. It is hoped that the building owner, after reading this discussion, will be able to recognize the areas where a chemical is needed, know how to apply it to these areas, and determine the quantity necessary in different types of construction. As all construction features cannot be listed, only those most common to Illinois buildings are discussed.

Outside Soil Poison

As already explained, termites construct runways between the soil and the wood upon which they feed. In order to break the contact of the termite colony with soil moisture, a chemical is applied to the soil that will either repel the termites or will kill those attempting to pass through the treated soil. A wide variety of soil poisons may be used for termite control; however, many of them are available only in large quantities. Only those that can be purchased in small quantities are listed in table 1. Creosote is not included in this table; although it is effective against termites when properly applied to wood, when it is applied to soil, it is rarely effective for longer than a year.

The quantity of soil poison necessary to treat the soil along the outside of a foundation wall will depend upon the depth and length of the wall. The total length of all the outside foundation walls multiplied by the depth of the foundation wall beneath the soil surface will give the square footage of foundation surface that must be rendered immune to termite attack. It is desirable to treat this foundation surface and all the abutting soil for a distance of 6 inches from the foundation. The cubic footage to be treated is approximately one-half (six inches equal one-half foot) the square footage of wall surface. From the cubic figure obtained, the quantity of chemical necessary can be learned by referring to table 1.

Let us assume that we wish to find the amount of trichlorobenzene, one of the effective soil poisons, necessary for a house measuring 30 feet by 40 feet and having a foundation wall extending 4 feet below the soil surface.

$30' + 40' + 30' + 40' = 140'$ (total length of all outside foundation walls)

140 (linear feet in foundation walls) $\times$ 4 (depth in feet of walls below soil surface) = 560 square feet

560 (square feet of wall surface) × ½ (width in feet of abutting soil to be treated) = 280 (cubic feet of soil to be treated)

In table 1, we find that trichlorobenzene should be diluted with four equal volumes of fuel oil, and the resulting solution applied at the rate of 1 gallon for each 2 cubic feet of soil to be treated, or one-half gallon for each cubic foot.

280 (cubic feet of soil) × ½ (gallonage per cubic foot) = 140 (gallons of poison solution)

As one-fifth of the 140 gallons of soil poison is trichlorobenzene and four-fifths oil, we must purchase 28 gallons of trichlorobenzene (1/5 of 140) and 112 gallons of oil (4/5 of 140).

The choice of a soil poison depends upon availability, price, and suitability to the situation. The three poisons listed in table 1 have been found satisfactory for use against Illinois termites. The combination of trichlorobenzene and pentachlorophenol is believed to be more effective than either of these chemicals used alone.

The use of an oil-soluble poison, such as trichlorobenzene or pentachlorophenol, is recommended if there is any danger of the chemical leaching to well or stream water. Because of their odor, trichlorobenzene and pentachlorophenol can readily be detected in drinking water. Chemicals should be applied very cautiously near sources of drinking water. In such places, it is better to make a light application, and possibly make a second if the first fails, than to apply too much chemical at one time.

Sodium arsenite, which is odorless and highly soluble in water, should not be used where there is danger of the poison leaching to well or stream water. Also because of its solubility, it should be used in treating the outside of foundations only where there is little danger of leaching; if used in treating a foundation so shallow that all the treated soil is reached by surface water, the poison will soon leach away and lose its effectiveness against termites. It may be used as a soil poison for the interior of buildings, or in other situations where the strong odor of trichlorobenzene might be objectionable, as in the outside treatment of basement walls so porous that the odor might penetrate into the basement.

As all the soil poisons are highly toxic to plant life, grass, flowers, and shrubs will not grow in the treated soil. It is not uncommon for shrubbery near the house foundation to die after the application of a soil poison. Usually, valuable shrubbery

Table 1.—Chemicals suitable for use in termite control, their approximate costs and the amounts required.

Chemical*	Odor	Physical Properties	Approximate Cost per 100 Cubic Feet of Soil	Formula	Dosage
Trichlorobenzene	Strong and persistent	Clear, heavy, oily liquid	$33	Mix 1 gallon in 4 gallons of fuel oil, kerosene or used crankcase oil	1 gallon for each 2 cubic feet of soil to be treated
Pentachlorophenol	Slight	Usually flakes of varying size, gray to brown in color	$24	Dissolve at rate of 2½ pounds of pentachlorophenol in either 1 gallon of pine oil or 2 gallons of an alkyl naphthalene. Dilute with fuel oil to make 7 gallons	1 gallon for each 2 cubic feet of soil to be treated
Trichlorobenzene and Pentachlorophenol	Strong and persistent	Heavy, golden brown liquid	$20	Dissolve at rate of 1 pound of pentachlorophenol per 2½ gallons of trichlorobenzene. Dilute with fuel oil to make 30 gallons	1 gallon for each 2 cubic feet of soil to be treated
Sodium arsenite	None	Crystalline solid, more or less gray and lumpy	$14	Dissolve 10 pounds in 11 gallons of water	1 gallon for each cubic foot of soil to be treated

*All chemicals listed are toxic to plant life. These chemicals, like many other insecticides, are harmful to the user unless proper precautions are taken. They are more or less irritating to the skin and mucous membranes if contact is permitted. When treatment is made in confined quarters, provision should be made for adequate ventilation. All chemicals should be stored in places inaccessible to children and animals.

should be moved from close proximity to the foundation wall before a poison is applied. The distance the plants should be moved from the wall will depend upon the type of root system and the size of the plants. If it is not desirable to move the shrubbery, a metal or tar-paper shield should be installed between the plants and the treated zone. The shield can be easily applied to the wall of the trench away from the house before the trench is treated and backfilled.

The length of time a soil poison is effective varies with the locality and the climate, the kind of soil, the amount of poison used, how well it is mixed with the soil, and the location of the water table. Sometimes the application of a soil poison exterminates the only termite colonies in the vicinity, and the fact that termites do not reappear in the treated structure is credited to the lasting effectiveness of the poison used; consideration is not given to the possibility that, if there had been a survival of termites in or near the structure after the original application, the effective period would have been very limited. Chemical treatments are usually guaranteed for 5 years by professional termite control operators. The term of 5 years is considered to be a safe average period of effectiveness for good soil poisons.

Professional termite control companies employ many labor-saving devices for applying the necessary chemicals. These include electric drills, pumps, special hose, and other special pieces of equipment.

The owner of one or a few buildings who cannot afford to purchase this labor-saving equipment can apply chemicals for termite control by digging a narrow trench to a depth of one-half the height of the foundation wall below the ground line, fig. 22. At the bottom of such a trench, one-half of the total amount of soil poison necessary should be applied from a sprinkling can which has the rose removed. The chemical should be applied in a narrow band to the soil against the house foundation. The trench should then be partially backfilled. The remainder of the chemical, one-half, should be used in making two to four applications above the first at about 7-inch vertical intervals, fig. 22; an equal amount of chemical should be used at each level. At each level except the first, the soil should be tamped in place after application of chemical. The process of backfilling, applying chemical, and tamping should be repeated until the trench is filled. The last application of chemical should be 2 or 3 inches below the ground line. Fig. 22 shows a cross

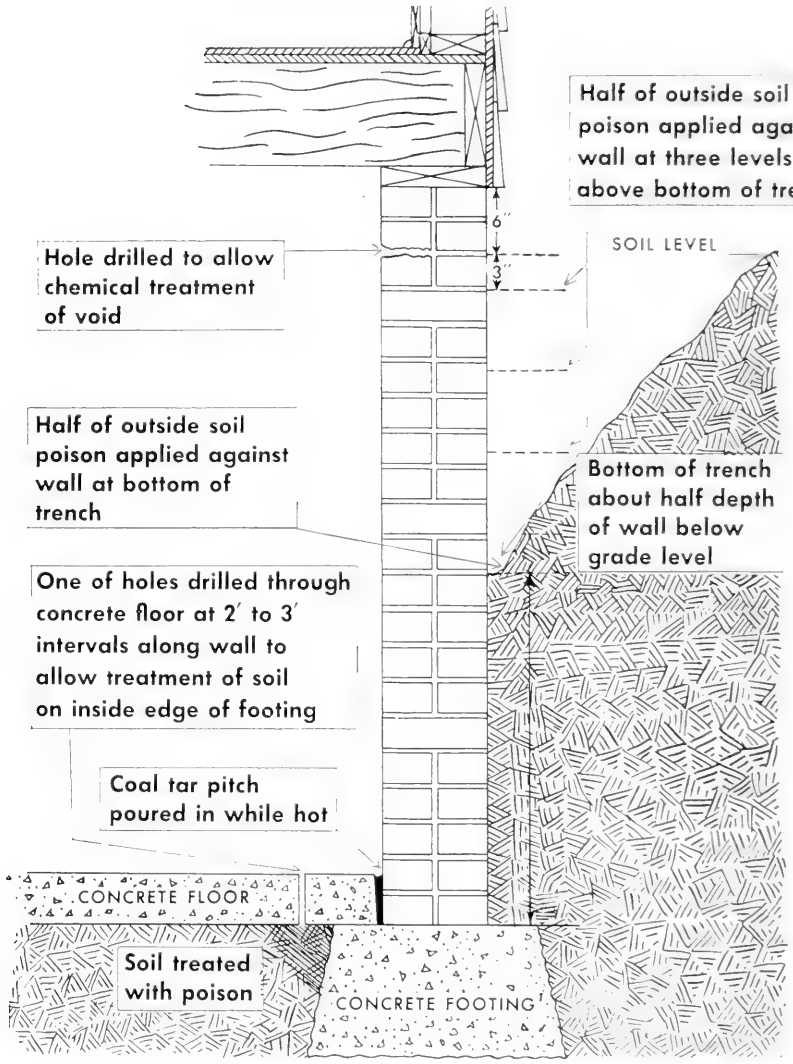

Fig. 22.—Cross section of a foundation wall showing where outside soil poison should be applied. A trench is dug along the entire length of wall to allow treatment of adjacent soil. The depth of the foundation and the type of soil will influence the depth of the trench and the number of levels at which the chemical should be applied for thorough penetration. Clay soils require deeper trenching and applications at more levels than more porous soils. Chemicals should not be applied to wet or frozen soils. Foundation walls with voids, and also floors through which termites might enter the walls, should be chemically treated, figs. 24 and 27. It is seldom advisable to go to the expense of installing a shield on a building that has been chemically treated.

section of a foundation wall and trench; it indicates where chemical should be applied to a wall that measures 4 feet below the ground line. The application of the outside soil poison should be made very thoroughly, and a sufficient amount of poison should be used.

When a concrete terrace or floor of a porch interferes with treatment of the outside foundation walls, holes may be drilled

Fig. 23.—When the concrete floor of a porch adjoining a house prevents easy treatment of the soil beneath, holes may be drilled in the concrete at about 2-foot intervals along the wall. Termite poison may then be applied with a funnel and oil can. If termite control is not achieved in this area with the first application, additional holes should be made and larger quantities of chemical applied.

in the terrace or porch floor at about 2-foot intervals and poison applied, figs. 23 and 32. If the first application does not result in control of termites, additional holes should be bored and larger quantities of poison used.

Foundation Wall Void Treatment

In buildings infested throughout with termites, all foundation walls containing one or more voids or hollow places must be treated if the termites are to be eradicated. Effective treatment repels termites so that they cannot gain access to wood through the voids. The poison used in treating voids is usually sodium arsenite or pentachlorophenol. Because of its persistent and objectional odor, trichlorobenzene is seldom used. The odor of trichlorobenzene may persist in basements a year or more after application of this chemical to the voids of the foundation walls.

The amount of chemical necessary to treat the voids varies with the type of wall and the tightness of the mortar joints. In most cases, about one-fourth of the amount used as an outside soil poison is sufficient. Proportionally more is needed if the footing of the foundation is close to the soil surface and little outside soil poison is used; in such a case, the amount of poison necessary to treat the voids in the foundation wall may equal the amount used as a soil poison. In the majority of foundation walls containing voids, holes should be made through the inner face of the wall to the void with a star drill and hammer. The holes should be made at or above the level of the soil surface so that the chemical will find small cracks and holes through which to penetrate to the foundation footing and give good protection against termites attempting to work through the foundation void from the soil outside. Fig. 24 shows sections of common foundation wall types and gives the location of voids where the chemical should be applied. Small cracks or holes are present in most flagstone foundations through which termites may gain access to wood without being seen, fig. 24A. Because of their irregularity, these cannot be treated effectively. With a foundation of the flagstone type, special emphasis should be placed on outside soil and basement floor treatment. Strongly recommended is proper installation of a shield at the time such a foundation is constructed.

Poured concrete foundation walls except those with settling

cracks, or those in which the contractor has failed to remove the expansion blocks, contain no voids or places through which termites may attack wood unseen, fig. 24*B*. However, because of various construction features of buildings having poured concrete foundations, termites often are able to enter unseen the wood in the buildings and cause considerable damage before they are noticed and stopped. Concrete foundation walls with wooden window frames close to soil, with wood extending through concrete floor, or with abutting concrete slab porches, as in fig. 32, provide easy avenues of entrance for termites.

Not many brick veneer buildings with poured concrete

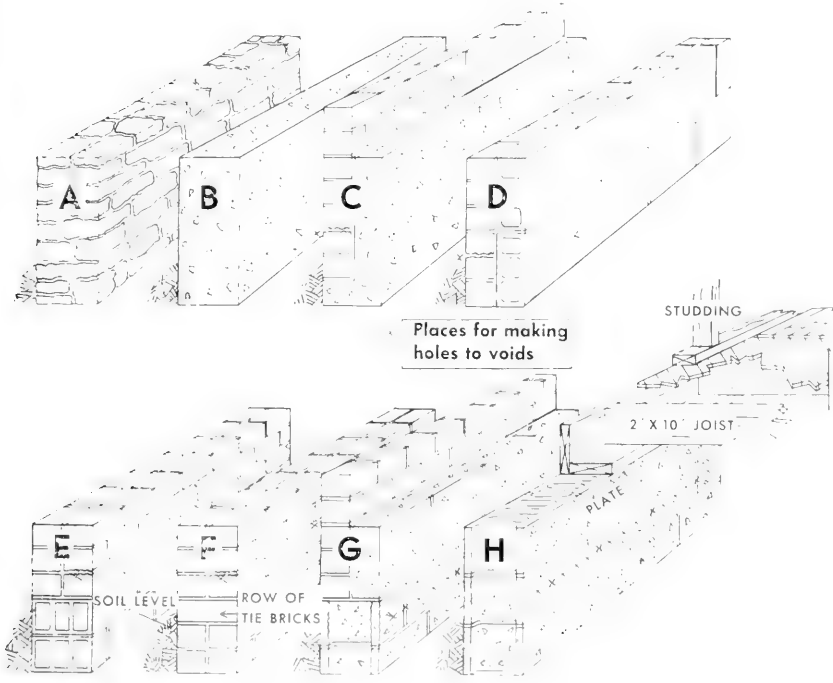

Fig. 24.—Eight types of foundation walls used in construction of buildings in Illinois: *A*, stone; *B*, poured concrete; *C*, poured concrete with brick veneer; *D*, brick and hollow tile; *E*, tile with solid brick; *F*, brick; *G*, concrete block with brick veneer; *H*, hollow concrete block. Shown here are the possible locations of voids and the places where chemical poison should be applied to control termites. The diagram of the frame superstructure in *H* makes apparent the ease with which termites may gain access to wood in this type of construction. A shield, usually metal or poured concrete, should be installed, when the building is constructed, to separate the foundation from the superstructure, fig. 18.

foundation walls have voids where the bricks and foundation walls meet, fig. 24*C*. Usually the voids have been filled with mortar. However, to treat a brick veneer building, it is wise to check for voids by using a hammer and star drill to make holes in the mortar between the bricks on the outside to the poured concrete foundation on the inside. If there are voids, they should be treated.

Foundation walls constructed of brick on the outside and hollow tile on the inside seldom have voids between the brick and tile, fig. 24*D*. However, such walls should be checked and all voids found should be treated. The tiles are usually laid with the voids running horizontally. To treat a wall so built, the chemical should be forced into the tile void at the level of the ground surface. Large amounts of termite poison may be placed in one opening, and often one side of the building may be treated through one hole. The poison should be applied until it fills the void or until it is seen to run from a crack or hole in the wall. The second hole should be made a yard or two past the opening from which the poison escapes.

Buildings having bearing walls made of hollow tile to the soil surface and then finished with brick, fig. 24*E*, may be treated after holes are made through the mortar between bricks in the row at the soil level. The holes should be about 3 feet apart.

Brick foundation walls usually contain voids, figs. 24*F* and 32. The size of the voids varies considerably. It depends upon the quantity of mortar used in building the wall and upon the length of the bricks in proportion to the width; the length of most building bricks is a little longer than the width of two such bricks. Voids in a foundation wall of this kind may be located by drilling holes in the mortar between the bricks. If a void is not found with the first hole drilled, it may be located by making another hole about a foot away and a row of bricks higher or lower. Holes for the application of poison solution should be made every 3 or 4 feet, preferably just above the ground line. Most brick foundation walls contain horizontal rows of tie bricks at more or less regular vertical intervals. Treatment should be applied above the row of tie bricks that are nearest the level of the ground line.

Concrete block foundations that have the voids covered by the foundation plates require more hole drilling than most other foundations. In foundations made of blocks containing three vertical interior voids each, four holes must be drilled for each

block in the row at the ground line: one hole for each of the three interior voids and one for the void made where blocks join, figs. 24*G* and 24*H*. At least one pint of chemical should be applied to each hole. A practical, inexpensive method of treatment is to insert a rubber tube through the hole to each void and pour the chemical into the tube, using a funnel and a suitable measuring device such as a filling-station oil can, fig. 25. After the foundation wall voids have been treated with poison, all holes drilled should be filled with crack filler or concrete.

When the foundation plate does not cover the voids com-

Fig. 25.—A method of applying termite poison to a concrete block foundation wall in which the foundation plate completely covers the foundation voids. Each void in a horizontal row of blocks at or above the level of the outside soil surface must be entered with a star drill or other suitable tool and the chemical applied. An odorless chemical should be used in this situation and in situations like it.

Fig. 26.—One method of applying termite poison to the voids in a concrete block foundation wall. In this wall, the 2- by 6-inch foundation plate only partially covers the voids, and the chemical can be applied to each of the voids from a suitable container such as an oil can.

pletely, fig. 26, a filling-station oil can may be used to introduce the chemical without the necessity of drilling holes.

Voids in all brick, tile, or block partition walls, as well as foundation walls, should be treated.

Basement Floor Treatment

Illinois termites move readily to areas where conditions are well suited for their development. During the summer months, the greater part of a colony may be in the soil outside the building or in the wood above the foundation. With cold weather, the termites may move below the frost line and become

more or less inactive until spring, or, when infesting a house with a centralized heating unit, they may migrate to the area beneath the basement floor, where conditions are suitable for continued activity. It is not uncommon during early spring for termites to be seen swarming from cracks in the basement floor around the furnace. For a thorough job of termite control, the basement floor, as well as the foundation walls and outside soil, must be treated with a suitable poison. If wood such as that in door casings, supporting wooden columns, and step runners extends through the floor to the soil, this wood should be sawed just above the floor surface, fig. 13; the wood extending through the floor to the soil should be removed, and the hole treated with chemical and then filled with concrete.

In unexcavated areas beneath the building, fig. 27, the soil inside the foundation wall must be treated the same as that on the outside, except that a relatively odorless poison should be used. If the soil is less than 18 inches from the floor joists, enough soil should be removed to make this clearance. Termites are able to construct tubes from infested floor joists to the soil if the clearance is less than 18 inches; by so doing they can make contact with soil moisture without coming in contact with the treatment applied for their control. If, after a soil poison has been applied to the inside foundation wall, inspection shows that termites have been successful in dropping a tube from the floor to the soil, this tube should be broken and the surface of the soil in this area treated with a poison that has little or no odor.

Basement floors paved with bricks, fig. 27, should be treated for termite control as follows: One or two rows of bricks should be removed from along the foundation walls, from around all wood that comes in contact with the brick floor, and from around the heating unit; then in each of these places from which bricks have been removed a 6-inch trench should be dug and filled with a non-odorous soil poison, such as sodium arsenite.

Concrete basement floors, figs. 27 and 32, require considerable effort for termite control treatments. Holes one-half inch to an inch in diameter should be made with a star drill along the foundation walls, fig. 28, along both sides of supporting walls, around heating units, and on one side of partition walls. The holes should be far enough from the foundation walls to miss the footing (usually 6 inches is sufficient) and they should be about 2 to 3 feet apart. Concrete floors may be treated with the trichlorobenzene-oil solution, usually at the rate of about

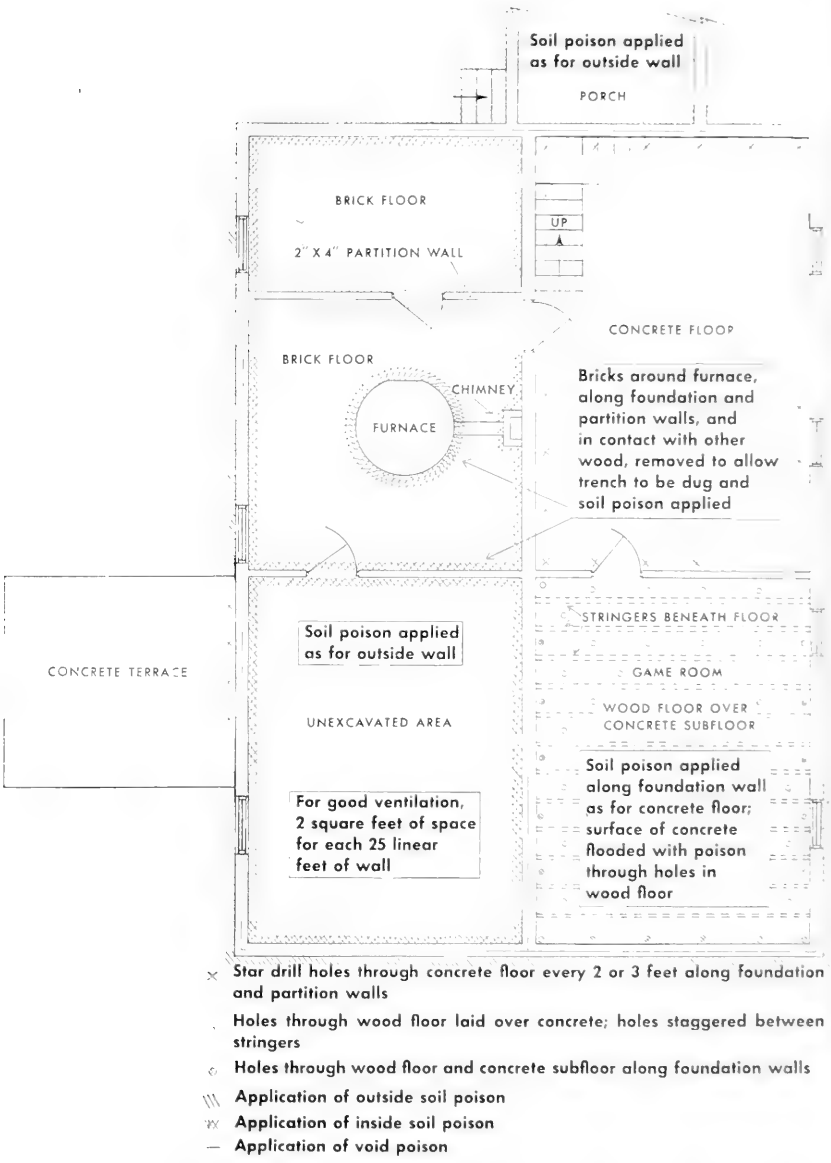

Fig. 27.—Basement floor plan showing where chemicals should be applied for control of termites. Treatment for a wood floor over concrete is about the same as for a concrete floor, plus flooding of entire surface between the wood and concrete with termite control chemical. Any chemicals used inside the house should be non-odorous. A raised porch is treated as indicated at top of diagram. Thoroughness is especially needed in treating the area around the heating unit, where termites are likely to be numerous.

1 or 2 quarts to each hole. Holes that will readily take more than this amount should have more added. The holes should be filled with concrete after the solution has soaked into the soil.

Treatment for the control of termites in places where hardwood floors are laid over concrete, fig. 27, as in basement apartments or game rooms and gymnasiums, is very difficult. The best way to treat such places is to remove the flooring and cover all cracks and holes in the concrete with hot, coal-tar pitch, after the soil beneath has been thoroughly treated as described in the paragraph above, or to lay another concrete floor over the old concrete and fill the expansion joints with hot coal-tar pitch. When the hardwood flooring cannot be removed economically,

Fig. 28.—Treatment of basement floors for the control of termites should vary with the type of floor, fig. 27. In concrete floors, holes should be made with a star drill every 2 or 3 feet along the foundation walls, around the heating unit, and at the base of door frames and step runners. A chemical poison should then be applied through the holes to the soil beneath. After this, the holes should be filled with concrete.

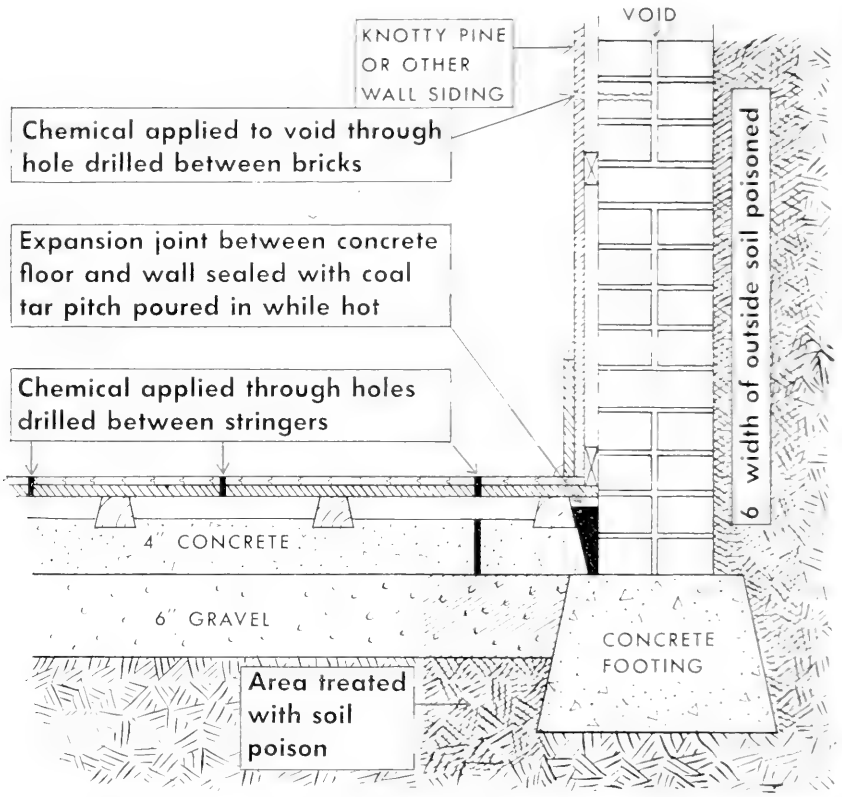

Fig. 29.—A cross section of part of basement game room indicating measures to be taken in combating a termite infestation. Soil poison is applied to the gravel and soil along concrete footing through star drill holes in concrete floor. All poisons used inside the house should be non-odorous.

the floor can be treated by boring holes through the wood the size of available dowels and then smaller holes through the concrete floor that will fit the nose of a funnel, fig. 29. The holes in the concrete floor should be placed and treated as for those described for concrete floors, page 33. Additional holes should be bored in the wood flooring so that they are at 4- to 8-foot intervals between stringers over the entire floor, fig. 29. An oil-soluble chemical with little odor should be poured into each hole until with the aid of a flashlight it is seen at the next hole. It should cover the concrete floor to a depth of about one-eighth inch.

The number of gallons of chemical required may be de-

termined by calculating the number of cubic feet necessary and converting this amount to gallons. For example, a floor 24 feet by 15 feet has an area of 360 square feet. As one-eighth inch is the desired depth of the chemical, the number of cubic feet will be 1/96 (one-eighth inch is one-ninety-sixth foot) of 360, or 3¾ cubic feet. As each cubic foot equals about 7½ gallons, 3¾ cubic feet equal about 28 gallons, the amount of chemical needed.

For the control of termites in a floor made of wooden blocks glued to a concrete subfloor, it is necessary to make a hole through both floors to the soil beneath and then to poison the soil. The holes, which should be staggered over the entire floor, should be not more than 3 feet apart. The holes in the concrete can be filled with hot pitch or concrete and the holes in the wood floor with sections of dowels.

Termite Specialists

The owner of a termite-infested building who is unable to treat the building alone, or with the help of local labor, may hire companies specializing in the control of insect pests found in buildings.

Any reputable company engaged in pest control should be able to make a thorough and effective application of chemical for the eradication of termites from a building. Companies that claim to specialize in termite control are not necessarily more effective in this work than the reliable pest control operators engaged in control of many types of insects.

Most companies engaged in pest control operations are reliable, and these companies are able in one application to eradicate termites from a building. As it is possible that companies may engage in work of this kind and use unreliable or unethical methods, the property owner seeking the services of a pest eradicator should be on his guard. According to report, some itinerant operators and, perhaps, companies have been so brazenly unethical as to recommend and apply treatment for insects that were not present. Representatives of such companies may carry live termites into a building, "plant" them in a likely spot, and show them as proof that the building is termite infested, or they may use a small drill or ice pick to make holes resembling those made by the powder-post beetle. Fortunately, the number of dishonest pest control companies is comparatively small.

In Illinois there is no law regulating the activity of persons or companies engaged in the control of termites or other insect pests; so the building owner should know how to evaluate pest control companies when he wishes to do business with one of them.

Although it is impossible to determine the presence of termites in a building without a thorough examination, reliable pest control companies usually consider the practice of going from door to door to offer free inspections and solicit business as unsound financially. However, most reliable companies, if asked to do so, will inspect a building free of charge and make an estimate or bid on the cost of treatment.

If a building is suspected of being infested with termites, and a pest control company confirms the suspicion, the building owner should insist upon seeing evidence of the infestation at the point of infestation.

In choosing a company to do termite work, keep in mind that governmental agencies do not single out and recommend individual pest control companies; that, although the chemicals used in termite control are expensive, they are not secret; and that all companies have access to suitable chemicals. Reliable companies do not claim endorsement by state or federal agencies nor do they make exorbitant claims for their materials or methods.

The application of chemicals to either the inside or outside of timbers in place does not constitute a complete termite-control job. Spraying of chemicals on structural timbers does not control termites.

After making an inspection of a termite-infested building, the reliable pest control company will make a bid on the cost of controlling the insects and will make no change in the price between the time the job is started and the time it is finished. For a five- or six-room house of average size and usual construction, the cost of chemical control of termites by a reliable company in many localities is usually about $150 to $200; these figures do not include the cost of structural repairs. Companies that do not understand termite control usually bid low—as low as $35 or $75 for "complete protection." Unscrupulous companies desiring to charge as much as the building owner can afford usually bid high. There is rarely a big difference in price quotations or in methods of control by competing companies that are ethical and that understand the control of termites. On all

jobs, bids should be asked from at least two companies whose reliability has been investigated through the better business bureau or the chamber of commerce of the city in which their home offices are located.

Most guarantees and bonds given by companies engaged in termite control specify that, for a period of 5 years after the first application of chemical, additional applications will be made free of charge whenever termites appear on the premises. They also provide that annual or semiannual inspections will be made free of charge during the term of the contract. An important point for the building owner to remember is that no guarantee or bond is better than the company making it.

Questions and Answers About Termites

1. How seriously and how soon will termites damage my house? In some cases termites cause considerable damage in 1 or 2 years, whereas in others they may be present for several years without causing appreciable damage. In numerous Illinois houses, it has been necessary to replace many floor joists, sections of subfloors, foundation plates, the bases of many studs, and window and door frames as a result of termite activity, fig. 3. The damage from any infestation of termites will depend upon a number of factors such as size and vigor of the termite colony, the type of materials in the building, and whether the termites remain active throughout the year.

2. Are all termites white in color? The adult workers, the termites that damage Illinois property, are wingless, sightless, and creamy white in color. Only the swarmers of the colony, which appear during the spring of the year, are black. After the swarming period, the black reproductive termites are rarely found.

3. How large are termites? The adult workers measure about three-sixteenths inch in length, fig. 12. Termite swarmers measure, with wings, about one-half inch in length. The aged termite queen in an established colony is the largest individual there. One queen removed from such a colony measured one-half inch in length by three-sixteenths inch in width, fig. 11. Termite queens in the tropics measure as much as $7\frac{1}{2}$ inches in length and are capable of laying thousands of eggs a year.

4. How fast do termites reproduce? The exact number of eggs laid by an individual of the termite reproductive forms is

not known. The number of eggs found in established colonies is large, often running into the thousands. The number of eggs deposited during the warm period of the year in mature, well-established colonies is probably several hundred a day. The total number laid depends upon the number of secondary and tertiary reproductive individuals present and whether the first or primary royal queen has remained in the colony. The number of reproductives depends upon the age and vigor of the colony.

5. What and how much do termites eat? Termites feed upon cellulose of many kinds. They have been known to damage rolls of paper, books, cardboard boxes, stored clothing, shoes, rugs, shelled corn, and growing trees and other plants, in addition to many kinds of wood products, figs. 30 and 31. The damage done by a single termite is small. The worker does not devote its entire life to eating away on cellulose but spends considerable time in helping to maintain the moisture supply of the colony and in soliciting body excretions from other termites. Small colonies kept in the laboratory have been found to require several weeks to consume a sheet of paper toweling. It is the feeding done by thousands of termites over a considerable period of time that causes serious damage.

6. Are termites active throughout the year? In Illinois, termites feeding on the debris of the forest floor are usually

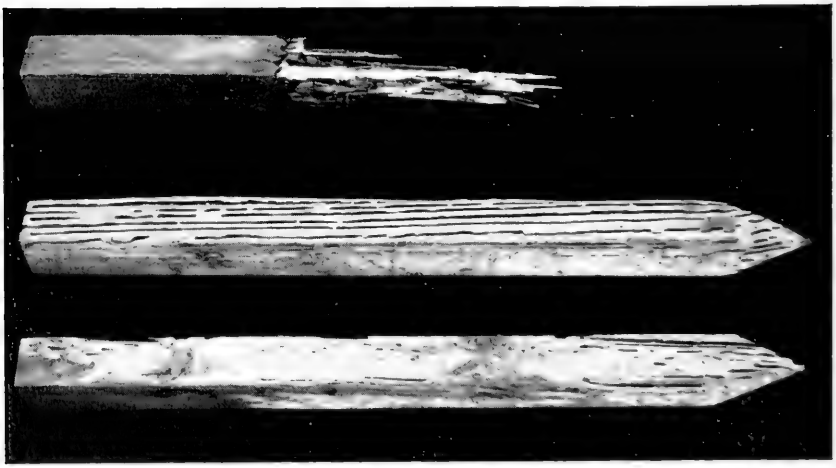

Fig. 30.—Wooden stakes, 2 inches square and 2 feet long, damaged by termites. That the insects feed upon the soft annual growth before consuming the remainder of the wood is evident in the middle stake.

Fig. 31.—A textbook severely damaged by termites. Paper is one form of cellulose upon which termites feed. Other forms are clothing, rugs, and plants of many kinds.

active until about the middle of November or early December. They spend the colder part of the year below the frost level in the ground. As the ground warms in the spring, the termites again become active at or near the surface. In the heated areas of homes, termite colonies may be active throughout the year.

7. Do other insects swarm at the same time as termites? Some insects swarm during late May and June, at the same time as termites; however, only a few species of ants and, in certain localities, winter stoneflies are apt to be confused with winged termites.

8. How do termite colonies become established in buildings? They become established there by one of two methods. In the first, a pair of swarming termites finds a suitable place and forms a new colony. In the second, an established colony, by lengthening the underground passageways in search of food, finds conditions suitable and establishes secondary colonies. In the areas where the primary reproductives are not present, secondary reproductives and sometimes tertiary reproductives take over the job of reproduction and help maintain a vigorous colony.

Questions and Answers About Termite Control

1. What should I do if my neighbor's building has termites? First make a thorough inspection of your own building to determine if termites are there, fig. 2. If you do not find them, you may wish to reconstruct parts of your building to prevent the insects from gaining access to it. If you find termites, you should determine the extent of damage and the size of the colony. If the damage is extensive, you should start control measures within a few months. If only minor damage is found, you may with reasonable safety put off chemical treatment for as long as a year or so. Termite control is expensive; however, if prompt action is taken, the cost of treatment may be far less than the damage that would result from a year's feeding by a well-established termite colony.

2. If I find termites swarming in or near my building, should I assume that my building is infested? If the swarmers occur in the basement, the building probably is infested. Individuals from termite colonies infesting wood out of doors may, in their flight from such colonies, be found on the sides of houses or on porches or sidewalks. If you find swarming insects in or near your house in the spring, determine what kind they are. If they are termites, you should make a thorough inspection of the premises.

3. How long will a chemical treatment for the control of termites be effective? Chemical control measures have a limited period of effectiveness. Five years is considered average. On the other hand, structural control measures are permanent.

4. Can I chemically treat my own house for the control of termites? If you are willing and able to do a heavy, dirty, and exacting job, you can successfully apply a chemical to a building for the control of termites. To be successful, you must purchase a good chemical and apply it in sufficient quantities wherever needed, figs. 22, 24, 27, 29, and 32.

5. Can I eliminate termites from my building by treating only part of it? If a thorough inspection reveals that the termites are localized in only a small part of the building and if their place of entrance can be located with certainty, the insects can perhaps be eliminated by reconstruction of that part of the building in which they are located, or by localized chemical treatment of the soil at the point of entrance. If the first partial treatment by chemical fails to eliminate the termites, a second

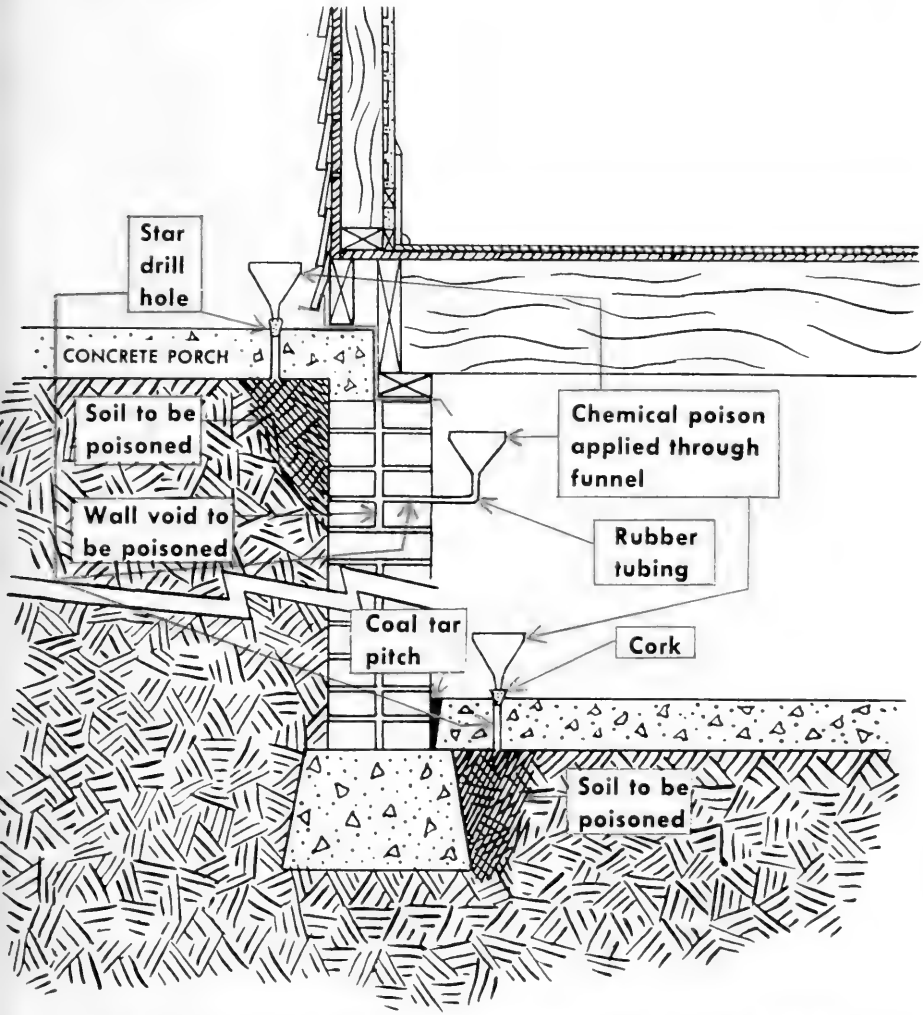

Fig. 32.—A concrete porch or terrace may provide a hidden area from which termites have access to structural timbers. Because of the impossibility of inspecting this area, incipient termite infestations there cannot be discovered and checked. When a building is being constructed, and sometimes when being reconstructed, a shield (indicated by red line) should be installed in such a way as to isolate the porch or terrace from the structural timbers. If the shield is properly installed at the time of building, chemical control measures should be unnecessary. When shielding is not practicable for termite-infested buildings, chemical poison should be applied to the soil beneath the porch or terrace, to the void of the adjoining foundation, and to the soil adjacent to the inside of the base of the foundation wall. In a building having a brick foundation, such as that shown here, the poison should be applied above the top row of tie bricks.

or third treatment that includes a larger area may be successful. If the building owner is doing the work himself, he may find several partial treatments cheaper and less time-consuming than a single complete treatment.

6. Where can I purchase a chemical for termite control? Often you can purchase the chemical at local stores handling chemicals. If your local stores cannot furnish the chemical you want in sufficient quantities or at a reasonable price, you can obtain it from chemical supply companies that maintain offices in large cities.

7. What happens to those termites present in the timbers of buildings at the time the chemical is applied? Even though the timbers are not injected with a toxic material, the termites will have been isolated by a chemical from their soil contact, and they will die soon after they have exhausted the available moisture supply in the timbers. The period of time required for the termites in infested timbers to die varies with local conditions and may be as long as a month or two.

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